

Women groups formed in response to public video screenings on rice processing in Benin

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When the Africa Rice Center (AfricaRice)¹ introduced improved parboiling technology in Benin in 2006 through farmer-to-farmer video, it enhanced women's creativity and motivation to parboil more and better the quality of rice. Their rice attracted more buyers and fetched a higher price which increased their profits and strengthened the women's social cohesion. The video motivated women to start parboiling as a group and to express group-based requests for credit and training. However, newly established women's groups in villages with strong negative experiences from the cotton sector did not last because of fear and mistrust. The video helped local non-governmental organizations (NGOs) to improve their training methods and strengthened their relations with rural communities and between the women rice processors and input and output markets. Although these NGOs responded by facilitating access to micro-finance institutions, they were unwilling to provide credit to the groups because of past bad experiences. Instead, informal credit suppliers proved more responsive. Rice producers who attended the open-air video shows at the same time as the women rice processors became more willing to sell them rice on credit. We discuss the conditions and challenges of farmer-to-farmer video in creating organizational and institutional changes among service providers and rural entrepreneurs.

Keywords: entrepreneurship; farmer-to-farmer video; institutional innovation; rural economy; social capital

Introduction

Agricultural extension was once defined as the transfer of knowledge from researchers to farmers, advising farmers in their decision making and educating farmers on how to make better decisions, enabling farmers to clarify their own goals and possibilities and stimulating desirable agricultural developments (van den Ban and Hawkins, 1996). In a recent paper, Swanson (2006) proposes that if national agricultural extension systems in developing countries are to survive as effective organizations, they must (1) refocus on getting farmers organized (that is, build social capital); (2) increase farm income and rural employment; and (3) thereby help to alleviate rural poverty.

Getting farmers organized requires the development of social cohesion, which builds shared values

and communities of interpretation, reduces disparities in wealth and income and gives people a sense that they are engaged in a community enterprise, faced with shared challenges, and members of the same community (Maxwell, 1996).

Social capital has gained popularity over the last decade; however, the overuse of the term has attracted criticism, particularly with respect to the definition of the concept (Fine, 2007). Robert Putnam defines social capital as 'those features of social organization, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions' (Putnam, 1993, p. 167). Three types of social capital are commonly identified. The ability to work positively with those closest to us who share similar values is termed 'bonding social

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capital'. Working effectively with those who have dissimilar values and goals is called 'bridging social capital'. Finally, the ability to engage positively with those in authority either to influence their policies or garner resources is termed 'linking social capital' (Woolcock, 1998, 2001; Pretty, 2005, cited by Hall and Pretty, 2008a). Social capital is increasingly recognized as an intervening factor in the process of social learning and information exchange. Social capital depicts the features of social organizations, such as social institutions, networks or associations, less institutionalized networks of friends, relatives and acquaintances (or private social networks) and civic engagement, that enable knowledge gathering and information exchange (Katungi *et al.*, 2008). Rizopoulos and Kichou (2001) – based on the multitude of definitions of institutions – define institution as any common reference or knowledge shared, device and constraint that make collective action possible. Institutional innovation is triggered by the interaction between institutions, identifying opportunities in a society, organizations and groups of actors set to benefit from these opportunities (North, 1991).

Over a decade ago, Pretty (1998) highlighted the importance of strengthening institutions and policies that could contribute to the construction of social capital in order for agriculture to become more sustainable. Methods such as participatory learning and action research and farmer field schools build social cohesion among farmers while they focus on learning between farmers, testing and modifying technologies. But the scaling up of these participatory methods remains a key challenge and their function and position in the R&D continuum may need to be reassessed (Van Mele *et al.*, 2005).

AfricaRice and partners, in collaboration with women rice processors in Benin, developed a video 'Cashing in with parboiled rice'.² This farmer-to-farmer video was produced following participatory technology development on improved parboiling and adhered to the zooming-in zooming-out (ZIZO) approach, which leads to locally appropriate and regionally relevant videos (Van Mele, 2006). ZIZO starts with a broad stakeholder consultation to define regional learning needs. Then communities are approached to get a better understanding about their ideas, knowledge, innovations and the words they use to describe the topic. Farmer-to-farmer video is then produced with selected communities, communicating basic ideas as much as ready-made technologies.

The video discussed in this paper describes the parboiling process using a vessel with perforated bottom

that is placed on top of a large aluminium pot. Improved rice parboiling can be summarized in five steps: washing, soaking in hot water, washing again, precooking with steam and drying. The parboiling video was originally produced in French and Fon, a major language spoken in Benin. Many local non-government organizations (NGOs) were involved in training women on proper parboiling and post-harvest techniques. Through the support of AfricaRice, the parboiling video was shown in 80 villages. While the local NGOs were used to working with rural communities in a relatively top-down manner, this was the first time that they used video.

In Benin, rice parboiling is exclusively done by women and girls in villages, mainly by rice households. It is a rice transformation process that contributes greatly to enhancing physical, chemical and organoleptic (involving substances that influence taste) quality of rice. Rural women use several traditional methods to parboil rice during which paddy touches the water during steaming. The principle behind the improved technology is that, after soaking, the paddy is transferred to the perforated container and pre-cooked with steam, without the paddy touching the water. This results in a much more homogeneous product and less breakage at milling. This improved method, along with improved handling before and after steaming the paddy, forms the key content of the rice parboiling video.

This paper looks at how video can: (i) boost the entrepreneurial mindset of rural women; (ii) build and strengthen social cohesion; (iii) stimulate intermediaries to improve their training methods; and (iv) strengthen collaboration between rural women and input and output markets.

Methods

The study was undertaken from November 2007 to May 2008 in five municipalities in the Collines department in central Benin, where local NGOs (Castor, LDLD, Rabemar and Un Monde) operate to strengthen the rice sector. The surveys covered 16 villages where the parboiling video was shown in 2006. The villages and the women were randomly selected (four villages per NGO and 10 parboiling women per village). We interviewed 160 women rice processors individually and 17 women groups. We also interacted with NGO staff.

Women's motivation for rice parboiling was analysed and ranked 0 to 2. During surveys, women were scored according to their interest in rice parboiling. This first score was based on a subjective measure

of the interest with which women speak about parboiled rice as income-generating activity and or auto-consumption activity. Women with a high interest in parboiling rice were scored 2, those with a moderate interest were scored 1 and those with little or no interest were scored 0. A self-ranking was also organized by women to classify themselves according to their degree of motivation to rice parboiling. Scores were then given to various categories (0 for no motivation, 1 for moderate motivation and 2 for high motivation). Then, an average score of the motivation was determined according to the scores of the self-ranking and the ranking based on their interest. Women who scored less than 1 are those who have a little motivation, those whose score is between 1 and 2 ($1 \leq \text{score} < 2$) have a moderate motivation and those whose score is 2 have a high motivation.

To assess rural women's entrepreneurial mindset, we also measured their behavioural change towards parboiling rice. Behavioural change towards parboiling was measured by the ratio of parboiled rice to paddy rice produced or purchased per year by each woman. Women whose ratio is 1 are those who parboiled all their rice; those whose ratio is between 0.5 and 1 ($0.5 \leq \text{ratio} < 1$) parboiled over half their rice and those with a ratio below 0.5 parboiled less than half.

In the section on building and strengthening social cohesion, some indicators such as the level of women's organization in groups were measured. Women who parboil rice in groups were scored 1 and those who do not parboil rice in groups were scored 0.

Quantitative data such as changes in women's motivation to parboil rice, behavioural change towards rice parboiling, rice parboiling objective and rice parboiling in groups were analysed using Wilcoxon test, Kruskal–Wallis test and χ^2 test. The specific tests used are indicated in the text.

Qualitative indicators such as how NGOs play their facilitation role, the collaboration between rural women, NGOs and micro-credit institutions and the commercialization of parboiled rice were assessed by regularly observing women's activities, through focus group discussions, photographic documentation and semi-structured interviews. Three months after the initial investigations, results were validated at a workshop in AfricaRice with staff from various NGOs in order to collect additional feedback from them and to stimulate learning between partners. Two years later, a new semi-structured interview was done on the field with NGO staff.

Results

Table 1 lists all the key organizational and institutional changes triggered by the open air video shows. Each of these changes will be discussed in more detail in the rest of the paper.

Video boosts rural women's entrepreneurial mindset

Women better understand the importance of, and increase their motivation to, parboil

Overall, women's motivation to parboil rice increased significantly after the video was shown in their villages (Table 2). The video also led some women to start parboiling for the first time. Those who already knew parboiling improved their practices (Zossou *et al.*, 2009b) and those who did not know it became interested in starting it.

Women's behaviour towards parboiling rice also changed significantly after viewing the video (Table 3).

In Central Benin, women rice processors are increasingly involved in rice production and parboiling. After watching the videos, the surveyed villages began producing and parboiling more rice. In some villages supported by the NGO LDLD, a traditional workshop that took place two years before the video did not create the interest in rice parboiling that is seen today. Many farmers are now abandoning some crops such as cotton to produce rice, making paddy available to the women rice processors who are active throughout the year. For example, in Alladji, a village of Savalou supported by the NGO Un Monde, the producers no longer grow cotton. Although this village was well known for cotton production, in 2008, they sowed about 20ha of upland rice. Women are becoming more interested in rice parboiling, as the story of T. Prisca from Awaya village in Dassa shows. Although a dressmaker at first, after the video shows she left her activity and began growing and parboiling rice. She is currently a member of the executive board of one of the women's groups that parboil rice in the village. She said she can now pay for her children's education with her rice parboiling income.

Women develop rice parboiling activity for profit

As the number of women who parboil rice has increased, along with the amount of paddy parboiled, rice is currently parboiled more for sale than for home

Table 1 | Behavioural and institutional changes triggered by the rice parboiling video

Types of change	Description of the change	Indicator	Factors that triggered change
Behavioural change	Women increase their motivation to parboil	After viewing the video, 72% of women became highly motivated to parboil rice	Women realized after watching the video that parboiling was a widespread technology and there was a much larger market out there than they initially realized
	Women develop rice parboiling activity for profit	88% of women who viewed the video currently parboil rice for profit. The quantity they parboil is 1.7 times higher than the quantity parboiled by those who did not watch the video	Improved rice quality by using improved parboiling technologies led to an increased demand by consumers
	Women increasingly organize themselves in groups to parboil rice	81% of women who viewed the video parboiled rice in groups after the video show	In some cases, the gift of an improved material for a whole village was a way that improved women grouping around rice parboiling To be organized in groups is a factor that increases trust and facilitates access to informal credit
	Women formulate group-based requests for new training	188 women were trained on construction and use of improved stoves (that they discovered in the video) and more rice parboiling training was done upon women's requests	The discovery of improved stoves during video shows led women to be interested in ecological problems during rice parboiling The increasing interest of women in rice parboiling led them to seek to know more about this activity
Behavioural and institutional changes	Intermediaries improve their training methods	NGOs strengthen their role as facilitators	The increasing interest of women in rice parboiling
		NGOs increasingly use pictures in their training to capture attention	The increasing demands to support rice parboiling
		NGO facilitators help women to better organize themselves	The increasing trust of women in NGOs led NGOs to improve their methods and to help women to better organize themselves
Institutional changes	Collaboration is strengthened between rural women and input and output markets	Relations between women and credit institutions are improved Relations between women and private sector traders and sellers are improved	Trust between various actors in the value chain is strengthened by: video shows; women's interest in rice parboiling; and increased demands for parboiled rice

consumption in surveyed villages. There is now more parboiled rice in local markets, and the quality has improved. This attracts more consumers and leads to more demand for parboiled rice. Many requests remain unsatisfied because of shortage of rice paddy. So the price of parboiled rice has not fallen in markets. Women have realized that parboiling adds significant value to rice. For example, in the

village of Segbeya, Savalou, A. Antoinette previously did not know how to parboil rice. Soon after watching the videos, she started parboiling at first for household consumption and later for sale. She then took the initiative to form a group of women in her village to parboil. Over time she convinced one of her neighbours, E. Bayi, to parboil rice. Although initially E. Bayi did not like eating parboiled rice,

Table 2 | **Changes in women's motivation (%) to parboil rice after watching the video (n = 119)**

Women's motivation	Before watching video	After watching video
Low	32.8 ^a	0.0 ^b
Moderate	66.4 ^a	27.7 ^b
High	0.8 ^a	72.3 ^b

Values in the same row with a different letter are significantly different at the 1 per cent level with Wilcoxon test.

Z = -10.490; asymptotic significance two-tailed = 0.000.

Table 3 | **Behavioural change (%) towards rice parboiling after watching the video (n = 119)**

Rice parboiling level	Before watching video	After watching video
Women who parboiled less than half their rice	33.6 ^a	0.0 ^b
Women who parboiled over half their rice	64.7 ^a	30.3 ^b
Women who parboiled all their rice	1.7 ^a	69.7 ^b

Values in the same row with a different letter are significantly different at the 1 per cent level with Wilcoxon test.

Z = -10.479; asymptotic significance two-tailed = 0.000.

A. Antoinette gave her parboiled rice whenever she had prepared some. As E. Bayi started to appreciate it, she gradually became a devoted parboiler herself, at first for her household consumption and then to sell. Currently, significantly more women who watched the video parboil rice for sale (Table 4).

The amount of rice parboiled for sale also significantly differed among women who viewed the video and those who had not seen it (Kruskal–Wallis test; $p = 0.017$). Women who did not view the video

Table 4 | **Percentage of women who parboiled rice for a particular objective**

Objectives	Women who did not watch the video (n = 41)	Women who watched video (n = 119)
Self-consumption	31.7 ^a	11.8 ^b
Consumption and sales	68.3 ^a	88.2 ^b

Values in the same row with a different letter are significantly different at the 1 per cent level.

Pearson χ^2 test. $\chi^2 = 6.550$, $df = 1$, p -value = 0.010.

produced a median of 300kg per cropping season, while those who viewed the video produced a median of 500kg per cropping season.

Most women said that while watching the video they became excited about the rice's colour, its cleanliness and the low rate of breakage after milling. This led them to use the new method and improve their rice quality so that it could easily be sold in markets. After seeing how little rice broke in the video, some of those who had only parboiled rice for home consumption started parboiling rice for sale. As women organized themselves into groups they also became more motivated to parboil rice.

The video builds and strengthens social cohesion

Women increasingly organize themselves in groups to parboil rice

Women declared that the organization of women as a group in the video caught their attention. Immediately after watching the videos, the women discussed working in groups with the NGO facilitators. Soon after, they organized themselves into groups to parboil rice. Table 5 shows the significant relationship between viewing the video and women's organization in groups to parboil rice. About 80 per cent of women who viewed the video parboiled rice in groups, compared to 51 per cent of women who did not see the video.

Women work in groups to parboil rice for others for pay, to solicit funds from micro-finance institutions, to buy paddy rice on credit, to package the parboiled rice and to label their products. Women also parboil rice in groups for health reasons. For instance, some women parboiled rice to sell so they could buy iodized salt after learning about the health benefits of iodized salt.

Two years after the first research, most of the women's groups that were formed just after seeing the video continued to function well. Women also organized themselves in groups on their own initiative to

Table 5 | **Percentage of women who parboil rice individually or in a group**

Parboiling activity	Women who did not watch the video (n = 41)	Women who watched video (n = 119)
Individual	48.8 ^a	19.3 ^b
Group	51.2 ^a	80.7 ^b

Values in the same row with a different letter are significantly different at the 1 per cent level.

Pearson $\chi^2 = 11.544$, $df = 1$, p -value = 0.001.

buy, store and process paddy and to sell the parboiled rice. However, four groups of women (in Monkpa, Lama, Dani and Gobada villages) that were formed just after the video shows stopped meeting because of disappointment, the fear of group work and the strong mistrust that developed following bad experiences with cotton over the last 10 years. This made women reluctant to work in groups. So despite their desire to organize, the groups did not always last.

Women formulate group-based requests for new training

Women discovered in the video an improved stove that consumes less wood. They addressed requests to local NGOs through their facilitators to be trained to make and use the stoves. About 188 women were trained and the improved stoves were built in 11 villages with the technical and financial support of some international NGOs. Women formulated additional requests for training in rice parboiling.

The video stimulates intermediaries to improve their training methods

NGOs strengthen their role as facilitators

After the videos were shown, 88 per cent of women said that their relationship and collaboration with local NGOs improved. The women became more interested in rice parboiling and asked NGO facilitators for training on the improved stoves, rice parboiling and to look for financial assistance to buy inputs (paddy, improved parboilers). Through the financial support of the international NGO, VECO Benin, some women groups received some improved parboilers. The farmers' requests after the video motivated NGO facilitators to further strengthen their own capacities and improve their knowledge.

NGOs increasingly use pictures

Before watching the video, the NGOs used a few pictures in their agricultural training. Rural people's interest in the rice parboiling video led NGOs to realize the importance of pictures. Since then, they have progressively shifted to the use of videos, pictures and diagrams that catch people's attention better. For example, the local NGOs Rabemar and LDLD started using photos of women taken during rice parboiling training events to show others how interesting rice parboiling is. Rabemar also showed the rice parboiling video in other villages during an awareness campaign on HIV/AIDS.

During their collaboration with VECO and just after having shown the video, all NGOs included in their budgets for following years funds to purchase a video projector, laptops, generators and a digital camera.

NGO facilitators help women to better organize themselves

In some villages, women who were interested in rice parboiling organized themselves into groups to get support from NGOs. NGOs contributed to the organization of women by their technical support and advice on good organization: official registration as groups, access to formal and informal credit, provision of market information on parboiled rice, paddy storage after harvest and good use of subsidized parboiling equipment. By receiving improved parboilers from the NGOs the establishment of women's groups for rice parboiling was further facilitated. The NGOs helped establish official relationships between women's groups and micro-finance services.

The video triggered NGOs to strengthen rural women's access to input and output markets

Rural women and credit institutions

The official registration of women's organizations with micro-finance institutions eased access to credit for parboiling. After the video shows, as relationships between NGOs and rural women improved, NGOs helped the women apply for micro-credit. Previously, NGOs did not provide this sort of support. But their negotiations with micro-finance institutions were unsuccessful for several reasons. Formal credit institutions require collateral that women fail to provide, especially when they are in groups because nobody wants to risk her own property. In this region, in the past there were some cases of credit non-recovery. This created a climate of mistrust that still remains. To overcome this climate of mistrust, the local NGOs have started mobilizing creditors to pay back their debts. This can open new opportunities for women in the future. Through a Benin government project named 'Micro credits to Poor', NGOs helped women's and farmers' associations get access to credit by facilitating the entire process. To develop and sustain parboiling, NGOs also helped women's groups to buy paddy on credit from rice producers. The presence of NGO facilitators during informal credit negotiation gives the producer more faith to sell rice paddy to women. Currently, women

have more access to informal credit than to formal credit.

Marketing of parboiled rice and skills

One of the challenges women faced is the marketing of parboiled rice. After the videos and due to the improvement of the rice quality, the NGOs identified traders and sellers who were interested in parboiled rice and facilitated their contact with the women's organizations.

Also, as parboiling experts some women started to offer their paid services to different actors for training in rice parboiling. Women also provided their services to NGOs that started to promote parboiled rice in urban areas. Through this, rural women obtain sufficient financial support to buy their own paddy.

A product is well appreciated and marketable when it is well packaged and attractive. To give an added value to parboiled rice, the NGOs expanded their role after the video show. Currently, they help women package the parboiled rice and explore how to improve the packaging, which is very important for marketing.

Discussion

The farmer-to-farmer video played an important role in social learning. Video-mediated training also triggered some organizational and methodological changes within the NGOs and strengthened their role as facilitators. Women organized themselves in groups after viewing the video and improved the social relations between themselves and with the NGO facilitators, traders and micro-finance institutions. They also started providing services on rice parboiling, and improved their methods of packaging and marketing parboiled rice. The relationship established between women, sellers and micro-credit providers following the video further strengthened social capital. Video seems to have a high potential to stimulate community processes and its broader use in development (Lie and Mandler, 2009).

The video motivated women to parboil rice, which led them to sell more parboiled rice of better quality and strengthened social cohesion among the women. Hall and Pretty (2008a) noted that rebuilding social capital is an important part of the institutional reform required to ensure that farmers and government together build the collective capacity to

succeed in the transition to more sustainability. Facilitated debates that build social capital and mediate conflict may overcome barriers (such as resentment) to public good provision and allow facilitators to identify better ways of exploiting social incentives that are cheap and self-perpetuating (Hall and Pretty, 2008b). The changes triggered by farmer-to-farmer video on social capital are equally due to a larger facilitation role assumed by the NGOs to enhance women's access to the improved parboiler, credit and marketing.

Our research shows that video is a powerful tool for rural extension and, as noted by Van Mele (2006), video can help to overcome the gender bias. In many rural settings, women are limited by social norms in communicating with men outside their families. In these cases, extensionists can act as interlocutors, but to truly speak on behalf of women, these interlocutors need to be women (World Bank, 2008). Although the majority of staff within advisory services are men and rural development interventions are male-biased (see for instance Lahai *et al.*, 2000; Squire, 2003; Katungi *et al.*, 2008), farmer-to-farmer video can help to overcome this bias, because it gives a fair chance to community members to learn from their peers, while public screenings also reduce the dependency on group leaders (Zossou *et al.*, 2009a). Women positively appreciated this 'community training tool' that stimulates active communication (vision, hearing and practical application) and self-learning. Although the video was made for rice parboilers, having shown it to the entire community enabled it to touch on a wider range of actors. This not only improved the quality of parboiled rice, but also strengthened social capital among women's groups and trust between the various actors in the rice value chain.

Conclusion

Apart from technologies, learning, facilitation, institutions and policy also contribute to the transformation of sustainable agriculture (Röling and Wagemakers, 1998). Earlier research showed that video has great potential to enhance sustainable agriculture by encouraging local innovations to take into account farmers' creativity (Zossou *et al.*, 2009b). This study shows to the use of farmer-to-farmer video triggered many behavioural and institutional changes among women and others in the rice sector.

Changes among and between actors matter as much as technological change, to make agriculture more sustainable in the long run.

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Notes

1. Africa Rice Center (AfricaRice for short) is an intergovernmental association of African countries. It is also one of the 15 international agricultural research centres supported by the Consultative Group on International Agricultural Research (CGIAR). www.AfricaRice.org
2. www.AfricaRice.org/warda/guide-video.asp.

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